DOCUMENT RESUME

ED 096 320 TM 003 891

TITLE	Wisconsin Learne Assessment: 1973 Pilot Year Summary Report. Volume 1.
INSTITUTION	Wisconsin State Dept. of Public Instruction, Madison. Div. for Management and Planning Services.
PUB DATE	Feb 74
NOTE	36p.; For related documents, see TM 003 899, 916, and 917
AVAILABLE FROM	Department of Public Instruction, 126 Langdon Street, Madison, Wisconsin 53702 (Free)
EDRS PRICE	MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS	*Educational Assessment; Grade 3; Grade 7; Mathematics; Pilot Projects; Reading; *State Programs; Test Results
IDENTIFIERS	*Wisconsin Learner Assessment Program

ABSTRACT

The objectives of the first year of the Wisconsin Assessment Program were: (1) to develop and refine the statewide assessment processes including instrument development, instrument administration, analysis, interpretation, and dissemination of results; (2) to provide a preliminary profile of how well students demonstrate their knowledge and skills concerning some important aspects of mathematics and reading; and (3) to develop baseline information for measuring progress over time. The assessment involved students in grades 3 and 7, and the results are reported in terms of the population value, i.e., an estimate of the percentage of children who probably would have answered the items correctly if all the individuals at that grade level had taken the test. General limitations of the results are presented and recommendations are made to better analyze educational program strengths or weaknesses. (RC)

ED 096320

WISCONSIN LEARNER ASSESSMENT :

1973 PILOT YEAR SUMMARY REPORT

VOLUME 1 REPORT 4

FEBRUARY 1974

Division for Management & Planning Services

Barbara Thompson, State Superintendent

DEPARTMENT OF PUBLIC INSTRUCTION

Prepared pursuant to regulations under Title III of P.L. 89-10, as amended, of the Elementary and Secondary Education Act of 1965,

and

In response to Wisconsin State Legislative Statute Chapter 125 Laws of 1971 s. 115.28 (10) Educational Assessment.

TM 003 891

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115.28(10) EDUCATIONAL ASSESSMENT. Develop an educational assessment program to measure objectively the adequacy and efficiency of educational programs offered by public schools in this state. The program shall include, without limitation because of enumeration, methods by which pupil achievement in fundamental course areas, as set forth in s. 118.01 (1), and other areas of instruction commonly offered by public schools, will be objectively measured each year. Assessment shall be undertaken at several grade levels on a uniform, state-wide basis.

118.01 CURRICULUM REQUIREMENTS. (1) FUNDAMENTAL COURSE. Reading, writing, spelling, English grammar and composition, geography, arithmetic, elements of agriculture and conservation of natural resources, history and civil government of the United States and of Wisconsin, citizenship and such other subjects as the school board determines shall be taught in every elementary school. All instruction shall be in the English language, except that the school board may cause any foreign language to be taught to such pupils as desire it.

State of Wisconsin DEPARTMENT OF PUBLIC INSTRUCTION

Barbara Thompson, Ph.D.
State Superintendent

Dwight M. Stevens, Ph.D.
Deputy State Superintendent

A pilot assessment for the statewide educational learner assessment was conducted in May 1973. This pilot program was intended as a first step in the process of identifying and publicly reporting the extent to which students in Wisconsin can demonstrate behaviors which relate to the goals and objectives of the public educational system.

This pilot phase was successful beyond expectations in that it revealed that the Wisconsin education community can work together to develop and implement a large scale educational assessment. Many interesting facts can be gleaned from this initial effort, but any direct state level use of assessment data for program decision-making will have to be delayed until the next assessment cycle when we move from the developmental pilot phase into the full scale assessment.

As State Superintendent of Public Instruction, I would like to express my deep appreciation to those educators who contributed their time and effort in developing and implementing the pilot assessment. Without the participation of over 700 Wisconsin educators this effort could not have been possible. I look forward to the continued interest and support of Wisconsin citizens and educators in the full implementation of the Wisconsin Learner Assessment Program.

Sincerely,

Barbara Thompson

Barbara Thompson
State Superintendent

126 Langdon Street, Madison, Wisconsin 53702

OVERVIEW

The 1973 Pilot Assessment in Reading and Mathematics was conducted in May 1973. This report is a summary of activities and results of the 1973 Pilot effort. Information in this report has been gleaned from three major reports which deal in detail with specific aspects of the assessment. The three reports described later in this document can be obtained from the Department of Public Instruction.

What was the impetus for the Wisconsin Assessment Program?

The Wisconsin Assessment Program was undertaken in response to a legislative mandate enacted in 1971. The assessment in Spring, 1973 was the pilot phase of an assessment program that will eventually measure performance characteristics of the state's educational programs and become one of several tools that will enable decision-makers to improve the education provided for Wisconsin's citizens.

Why should the 1973 Spring Assessment be considered a Pilot?

The 1973 assessment in mathematics and reading is a pilot for two reasons. First, it is the Wisconsin Department of Public Instruction's initial effort in developing a large scale statewide assessment. Accordingly, new technology and processes had to be developed and implemented by the educators in the state. Second, the financial support provided by the Wisconsin State Legislature was commensurate with a pilot project, considering the magnitude and necessary supportive funding of a comprehensive statewide educational assessment effort.

What can be learned from the Pilot?

The term "pilot" usually connotes a "tryout" in which the results are primarily useful for determining the practicality of the applied methods. This first effort, in addition to verifying methods, resulted in the collection of achievement data which can give a preliminary indication of how well third and seventh graders in Wisconsin demonstrate some skills and knowledge in mathematics and reading. Future assessments should be designed to provide a more comprehensive profile of how well the students in Wisconsin demonstrate skills and knowledge in important aspects of reading and mathematics.

What are the objectives of the Pilot Assessment?

The objectives of the first year of the Wisconsin Assessment Program were:

1) To develop and refine the statewide assessment processes in Wisconsin including a) instrument development, b) instrument administration, c) analysis, d) interpretation and e) dissemination of the results.

2) To provide a preliminary statewide profile of how well Wisconsin students demonstrate their knowledge and skills concerning some important aspects of mathematics and reading.

3) To develop baseline information for measuring progress over time.

The first objective, developing the program, was the primary thrust for 1973. The second objective in which statewide results are related to specific performance objectives is found summarized in the results section of this report. The third objective is a longitudinal effort that requires cycling several measures over years in order to identify trends. The 1973 pilot results will make possible the future measurement of progress.

How were the Reading and Mathematic objectives and instruments developed?

The mathematics and reading portions of the 1973 Spring Assessment were objective-referenced making the development of the final instruments a two-step process. First, educators representing elementary, secondary and post-secondary education identified the skills and knowledge which third and seventh graders would be expected to demonstrate. The lists of skills and knowledge were labeled objectives. Second, exercises (items) which were appropriate measures of the objectives were developed or identified from existing item collections.

The Wisconsin State Reading Committee was asked by the Department of Public Instruction to develop an assessment of reading. The committee delegated the task to a subcommittee on testing and evaluation.

One of the early decisions of the subcommittee was to have the Madison school district pilot an assessment instrument to examine the feasibility of extending its use on a statewide basis. The instrumentation was based on the closure (CLOZE) procedure giving student passages from scientifically

selected, commonly used materials in which every fifth word was deleted. The students were then expected to fill the blanks with the correct word. The results would indicate the degree to which students are able to read based on the percentage of correct responses.

It was evident from the experience of the CLOZE assessment that if used, the CLOZE should be accompanied by another objective-referenced instrument. An apparent lack of public confidence in the CLOZE procedure, even though it has a sound scientific basis, and the necessity for hand-scoring answer sheets were the major reasons for not utilizing the CLOZE test exclusively or in conjunction with another measure of reading.

The subcommittee found that the reading assessment exercises released by the National Assessment of Educational Progress (NAEP) were the only objective-referenced exercises available for both the third and seventh grades. The exercises were grouped into 8 to 10-minute time blocks of reading items in each of the five packages. Pilot testing of the reading exercises was deemed unnecessary because all items have been previously validated and used on a nationwide sample of students by NAEP.

The Wisconsin Statewide Mathematics Assessment Committee, composed of representative groups of math educators, was charged with the task of developing a Mathematics Assessment Program. The test items used in the assessment were written to measure performance on part of a comprehensive set of over 400 content objectives for mathematics, graded K-8. The objectives and test items were created over a seven-year period under Department of Public Instruction leadership.

The final assessment instruments consisted of five test packages (booklets), each containing unique mathematics and reading items. Two packages were prepared for third graders and three for seventh graders. Consequently, two packages for third grade and three for seventh grade are considered as the total assessment test at each grade level. Each student was administered one package, therefore, each third grader answered only one-half of the assessment items while each seventh grader answered one-third. As a result, no statements can be made about individual student performance in mathematics and reading.

Who were the students assessed and how were they selected?

In designing the 1973 pilot assessment several factors influenced the decision to assess a representative sample of students rather than to assess every third and seventh grader attending Wisconsin public schools. First, since a statewide profile of how well third and seventh graders performed was desired, there was no need to collect data on every student as is needed for individual diagnostic purposes. Second, the number of objectives to be assessed in mathematics and reading represented over six hours of testing at both third and seventh grade. Third, limited resources provided to the Department made it impossible to assess every pupil. Thus, sampling appeared to be the only viable alternative and was developed and implemented through a contract with Research Triangle Institute (RTI) of North Carolina. The plan was based on the premise that 2,000 students were required to take each package to constitute a reliable measure of each item.

At the third-grade level two packages were developed; therefore, 4,000 students needed to be sampled (2 packages x 2,000). At the seventh-grade level three packages were developed; 6,000 students were selected for the sample (3 packages x 2,000). The selection of students was a two-stage process that consisted of selecting representative schools and then randomly selecting students within each designated school. The schools were representative of Wisconsin in three respects: a) geographic location, (see map), b) schools which are part of various-sized school districts (small, medium and large),* c) various grade enrollment sizes.** The selection of third-grade

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*District Size Categories

Categories	Description
0 to 1,000	All LEA's whose total enrollment was less than 1,000
1,000 to 7,000	All LEA's whose total enrollment is between 1,000 and 7,000
7,000 and more	All LEA's whose total enrollment is greater than or equal to 7,000

**Grade Size Categories

Categories	Description
0 to 20	All schools of less than 20 third-graders
20 to 150	All schools having between 20 and 150 third-graders
150 and more	All schools of at least 150 third-graders

**Grade Size Categories

Categories	Description
0 to 100	All schools of less than 100 seventh-graders
100 to 450	All schools having between 100 and 450 seventh-graders
450 and more	All schools of at least 450 seventh-graders

schools participating in the sample was performed independently of the selection of seventh-grade schools. Once the schools were selected, students were randomly chosen from a roster submitted by each school. Table A shows the number of students per region assigned each test package.

TABLE A

	TEST PACKAGE					Total
	THIRD GRADE		SEVENTH GRADE			
Region	Form A	Form B	Form A	Form B	Form C	
NW	396	389	410	401	416	2,012
NE	419	367	418	421	412	2,037
SW	464	467	452	461	457	2,301
SE	797	783	672	705	740	3,697
TOTAL	2,076	2,006	1,952	1,988	2,025	10,047

As a result of the sampling procedures 10,047 students, representing 258 school districts and 505 schools were selected. These data are given in greater detail in Table B.

TABLE B

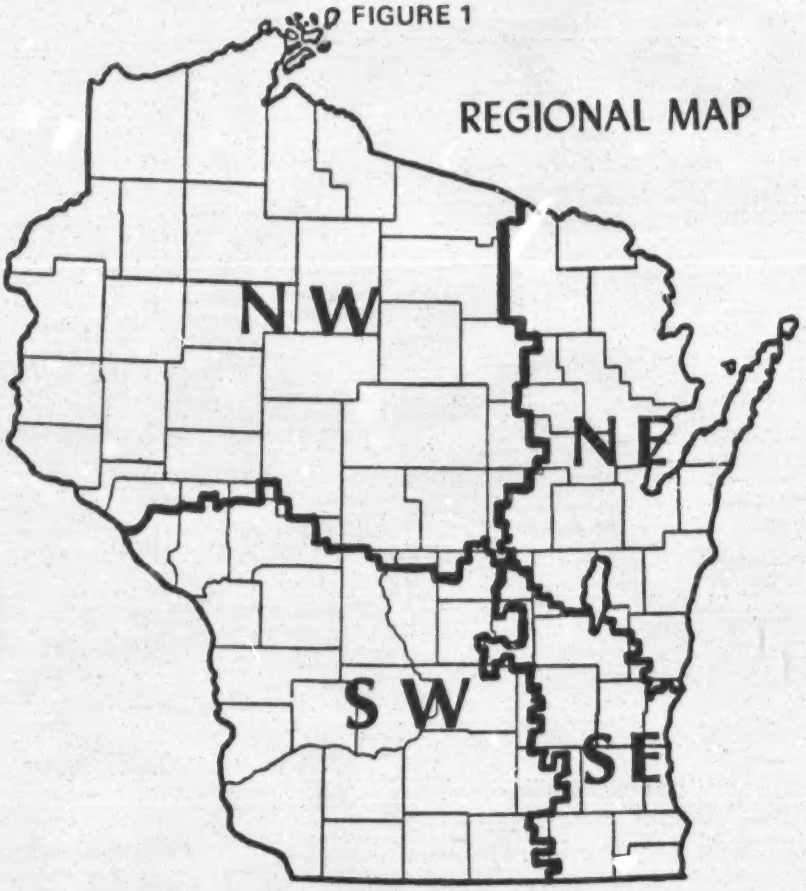
NUMBER OF PARTICIPANTS

REGION	DISTRICTS	SCHOOLS	PUPILS
NW	70	103	2,012
NE	53	100	2,037
SW	77	126	2,301
SE	58	176	3,697
TOTAL	258	505	10,047

A list of participating school districts can be found in Report #1.

FIGURE 1

REGIONAL MAP



DEFINITION OF FOUR ASSESSMENT
REPORTING REGIONS IN TERMS OF
COOPERATIVE EDUCATIONAL SERVICE AGENCIES (CESA's)

Reporting Regions		CESA's of Region
Code	Name	
NW	Northwest	1, 2, 4, 5, 6, 7
NE	Northeast	3, 8, 9, 10
SW	Southwest	11, 12, 13, 14, 15, 17
SE	Southeast	16, 18, 19

Who administered the assessment?

The 1973 Spring Assessment was administered by local school personnel who attended a half day training session conducted by the Department of Public Instruction. In some instances, where a district had more than one school participating, the district superintendent appointed an assessment coordinator to coordinate all district activities related to the 1973 Spring Assessment.

How were the test packages administered?

Instructions were recorded on audio reel-to-reel tapes which were played during the testing period. The tape standardized the instructions and the rate at which the assessment was administered. The introductory section of the tape was devoted to explaining the purpose of the assessment, describing the testing procedures and introducing sample items for the students to work. The remainder of the tape indicated when students were to begin and finish working on specific sections of the assessment instrument. Most sections of the assessment were approximately ten minutes long which allowed most students enough time to complete all of the items. This mode of administration was well accepted by local personnel.

What kind of statistical analysis was performed?

Statistical analysis was conducted by the University of Wisconsin Testing Service which obtained the following information for each item:

State Sample -- the actual percentage of children in the sample who responded correctly to each item and each incorrect choice (distractor).

State Population -- the estimated percentage of children who probably would have answered the item correctly if all the individuals at that grade level in Wisconsin had taken the test.

Region Population -- the estimated percentage of children at a particular grade level in a region of the state who probably would have answered the item correctly if all the individuals at that grade level in the region had taken the test.

Standard Error of Measurement -- an estimate of the variability of the score in repeated sampling with a fixed sample size and sample design.

How were the results interpreted?

The interpretation of assessed subject areas were made by educational professionals. A mathematics committee and a reading committee were formed to interpret the assessment data. The members of these committees were teachers, curriculum specialists, and university personnel from across the state.

The committees interpreted results, critiqued items and made some summary statements about general trends in their respective content areas. The technical and interpretative reports can be obtained from the Research & Evaluation Section of the Department of Public Instruction at 126 Langdon St., Madison, WI 53702.

Wisconsin Learner Assessment Pilot Year Report (#1)
A technical documentation of the sampling procedures, objectives, items, mathematics and reading results, advisory committees and comments.

Interpretive Report on the Wisconsin Mathematics Assessment (#2)
Documents the Mathematics assessment program and interprets the pilot results.

Interpretive Report on the Wisconsin Reading Assessment (#3)
Documents the Reading assessment program and interprets the pilot results.

PILOT RESULTS

This section summarizes the results obtained in the 1973 Pilot Assessment. All results are reported in terms of the population value - an estimate of the percentage of children who probably would have answered the items correctly if all the individuals at that grade level in Wisconsin had taken the test.

General Limitations of the Results

1. This is an initial attempt to obtain a profile of statewide student performance at only two grade levels -- third and seventh. Therefore, the assessment does not necessarily reflect the capabilities of Wisconsin students at all grade levels.

2. The profiles reported reflect an important but limited set of objectives. Because of time limitations some objectives were deferred for future assessments.

3. The domains are used as organizer terms and not for quantitative units of analysis. The mathematics profile emphasizes the "basic skills" of mathematics and not the real world application of those skills. The reading domains and objectives provide a valid model to evaluate reading ability, but the items measuring the domains and objectives are not as comprehensive as the model and preclude a comprehensive evaluation of the results.

4. Since only one test item was included for each specific mathematics performance objective and several reading objectives, there is no guarantee that the item is representative of those that could be constructed to measure the objectives.

5. In general, many interesting findings can be gleaned from the results but the direct state level use of data for program decision-making will have to be deferred until the next assessment cycle when the full scale assessment will be implemented.

THIRD GRADE READING SUMMARY

I. COMPREHENSION OF WORD LENGTH UNITS OF MEANING.

*R 1 Attach a probable meaning to an unknown word based on its contextual associations.
- 1.1 - 75%
- 1.2 - 79%
- 1.3 - 79%

R 2 Understand word meanings in context.
- 2.1 - 73%

R 3 Comprehend word meanings in isolation.
- 3.1 - 84%
- 3.2 - 88%
- 3.3 - 85%

R 4 Understand meanings indicated by word order and different parts of speech.
- 4.1 - 83%

R 5 Recognize structural parts of words as an aid to getting the meaning.
- 5.1 - 85%

R 6 Use function words to aid in understanding meaning.
- 6.1 - 91%

II. COMPREHENSION OF SYNTACTIC UNITS OF MEANINGS: PHRASES, CLAUSES, AND SENTENCES.

R 7 Follow written directions.
- 7.1 - 93%
- 7.2 - 77%

R 8 Understand signs and labels.
- 8.1 - 77%
- 8.2 - 67%
- 8.3 - 68%

III. LITERAL COMPREHENSION OF INTER-SYNTACTIC UNITS OF MEANING: Paragraphs and Passages.

R 9 Read for significant facts.
- 9.1 - 37%
- 9.2 - 43%
- 9.3 - 34%
- 9.4 - 75%
- 9.5 - 87%
- 9.6 - 79%
- 9.7 - 82%
- 9.8 - 47%
- 9.9 - 55%
- 9.10 - 62%
- 9.11 - 41%
- 9.12 - 26%
- 9.13 - 52%
- 9.14 - 72%
- 9.15 - 71%
- 9.16 - 59%
- 9.17 - 78%
- 9.18 - 61%
- 9.19 - 68%

R10 Read for facts and understand relationships.
- 10.1 - 35%
- 10.2 - 62%
- 10.3 - 45%

*Objective/item numbers refer to the actual test item found in the technical and interpretive reports.

IV. INFERENTIAL COMPREHENSION

A. Analytic Inference.

R11 Draw inferences from information given.
11.1 - 36%
11.2 - 80%
11.3 - 54%

R12 Inferences from information given plus additional knowledge.
12.1 - 77%
12.2 - 19%
12.3 - 67%
12.4 - 48%
12.5 - 80%
12.6 - 49%
12.7 - 74%

R13 Determine the main idea when it is not directly stated.
13.1 - 45%
13.2 - 78%
13.3 - 30%
13.4 - 51%

B. Evaluative Inference.

R14 Draw inferences from information given.
14.1 - 70%
14.2 - 18%

R15 Inferences from information given plus additional knowledge.
15.1 - 68%
15.2 - 63%

R16 Determine the main idea when it is not directly stated.
16.1 - 24%
16.2 - 81%

V. RECOGNIZE THE UTILIZATION OF LITERARY DEVICES.

R17 Understand the author's purpose and projected viewpoint.
17.1 - 74%
17.2 - 81%
17.3 - 61%
17.4 - 9%
17.5 - 45%

R18 Interpret figures of speech.
18.1 - 61%
18.2 - 39%
18.3 - 66%
18.4 - 33%
18.5 - 65%

VI. COMPREHENSION OF NON-TEXTUAL AND REFERENCE MATERIALS.

R19 Select the sentence that best interprets a picture.
19.1 - 83%
19.2 - 90%

R20 Obtain information from maps.
20.1 - 81%
20.2 - 83%
20.3 - 85%
20.4 - 73%
20.5 - 63%

R21 Find information in encyclopedias, directories, and indexes.
21.1 - 46%
21.2 - 57%
21.3 - 57%

SEVENTH GRADE READING SUMMARY

I. COMPREHENSION OF WORD LENGTH UNITS OF MEANING.

R22 Attach a probable meaning to an unknown word based on its contextual associations.
- 22.1 - 96%
- 22.2 - 93%
- 22.3 - 80%
- 22.4 - 57%

R23 Understand word meanings in context.
- 23.1 - 96%
- 23.2 - 76%

R24 Recognize structural parts of words as an aid to getting the meaning.
- 24.1 - 98%

R25 Use function words as an aid in getting the meaning.
- 25.1 - 98%

II. COMPREHENSION OF SYNTACTIC UNITS OF MEANING: PHRASES, CLAUSES AND SENTENCES.

R26 Follow written directions.
- 26.1 - 97%

R27 Understanding signs and labels.
- 27.1 - 97%
- 27.2 - 74%
- 27.3 - 97%
- 27.4 - 96%
- 27.5 - 90%

III. LITERAL COMPREHENSION OF INTER-SYNTACTIC UNITS OF MEANING: Paragraphs and Passages.

R29 Read for significant facts.
- 29.1 - 73%
- 29.2 - 70%
- 29.3 - 83%
- 29.4 - 57%
- 29.5 - 75%
- 29.6 - 83%
- 29.7 - 74%
- 29.8 - 92%
- 29.9 - 86%
- 29.10 - 74%
- 29.11 - 58%
- 29.12 - 79%
- 29.13 - 33%
- 29.14 - 81%
- 29.15 - 85%
- 29.16 - 88%
- 29.17 - 96%
- 29.18 - 80%
- 29.19 - 22%
- 29.20 - 79%

R30 Read for facts and understand relationships.
- 30.1 - 90%
- 30.2 - 77%
- 30.3 - 47%
- 30.4 - 87%
- 30.5 - 83%
- 30.6 - 50%

IV. INFERENTIAL COMPREHENSION

A. Analytic Inference.

R31 Draw inferences from information given.
- 31.1 - 67%
- 31.2 - 26%
- 31.3 - 71%
- 31.4 - 94%
- 31.5 - 15%
- 31.6 - 29%
- 31.7 - 25%
- 31.8 - 79%

R32 Draw inferences from information given plus additional knowledge.
- 32.1 - 84%
- 32.2 - 45%
- 32.3 - 95%
- 32.4 - 52%

R33 Determine the main idea when it is not directly stated.
33.1 - 77%
33.2 - 77%
33.3 - 22%
33.4 - 82%

R34 Analyze passages for consistent logic.
34.1 - 47%
34.2 - 83%
34.3 - 65%

B. Evaluative Inference.

R35 Draw inferences from information given.
35.1 - 92%
35.2 - 56%

R36 Draw inferences from information given plus additional knowledge.
36.1 - 90%
36.2 - 44%

R37 Determine the main idea when it is not directly stated.
37.1 - 54%
37.2 - 10%
37.3 - 15%
37.4 - 98%

V. RECOGNIZE THE UTILIZATION OF LITERARY DEVICES.

R38 Interpret figures of speech.
38.1 - 22%
38.2 - 34%
38.3 - 67%
38.4 - 71%
38.5 - 61%

R39 Perceive the author's tone or mood.
39.1 - 42%
39.2 - 27%
39.3 - 30%
39.4 - 80%

R40 Examine the author's word choice and projected viewpoint.
40.1 - 67%
40.2 - 47%
40.3 - 23%

VI. COMPREHENSION OF NON-TEXTUAL AND REFERENCE MATERIALS.

R41 Select the sentence that best interprets a particular picture.
41.1 - 98%
41.2 - 95%

R42 Obtain information from tables and lists.
42.1 - 86%
42.2 - 88%
42.3 - 63%
42.4 - 86%
42.5 - 45%
42.6 - 32%

R43 Obtain information from charts and graphs.
43.1 - 62%
43.2 - 30%

R44 Obtain information from maps.
44.1 - 93%
44.2 - 97%
44.3 - 97%
44.4 - 90%
44.5 - 86%

R45 Find information in encyclopedias, directories, and indexes.
45.1 - 74%
45.2 - 87%
45.3 - 90%

COMPREHENSION OF WORD LENGTH UNITS OF MEANING

Domain I objectives focus on the ability of students to understand the meaning of individual words either alone or in a specific context. This is important since words must be understood before the individual can deal effectively with the material. Understanding words is recognized as a basic skill needed in reading and should be measured in any comprehensive assessment of reading ability.

Objectives in this domain are:

	Third Grade	Seventh Grade
Attach a probable meaning to an unknown word based on its contextual associations.	R1	R22
Understand word meanings in context.	R2	R23
Comprehend word meanings in isolation.	R3	---
Understand meanings indicated by word order and different parts of speech.	R4	---
Recognize structural parts of words as an aid to getting the meaning.	R5	R24
Use function words to aid understanding meaning.	R6	R25

Summary

Overall, both grade levels did well on these short items. The results of this domain are limited by the use of only one item measuring several objectives, and some items were considered defective because of construction.

Despite these problems, third grade student scores ranged from 73% to 91% on 10 items. The range of performance at the seventh grade level was 57%-98% on 8 items. The objectives properly focused upon the importance of sentence context in shaping meaning and, for the most part, the items appeared appropriate. There was no measurement of such essential vocabulary skills as precision in the knowledge of words or breadth of vocabulary. Decoding and comprehension skills that involve getting word meanings from definitions, explanations, comparison and contrast were not assessed.

COMPREHENSION OF SYNTACTIC UNITS OF MEANING: Phrases, Clauses and Sentences

Domain II focuses on the student's ability to understand groups of words by reading signs, and written directions. The items require the student to read short sentences and phrases. Literal comprehension is the basic comprehension skill taught to children; to read, the reader must first grasp what the book really means.

Objectives in this domain are:

	Third Grade	Seventh Grade
Follow written directions.	R7	R26
Understand signs and labels.	R8	R27
Recognize grammatically acceptable structure.	--	R28

Summary

Third grade scores ranged from 67% to 93% on five items. In several of the items, difficult vocabulary may have had more to do with the lower scores than inability to read directions or signs. Seventh grade scores ranged from 74% to 97% on seven items. Two objectives were tested by only one item; however, the questions seem difficult enough to suggest that the high performance by seventh graders suggests good skill performance at this level.

LITERAL COMPREHENSION OF INTERSYNTACTIC UNITS OF MEANING: Paragraphs and Passages

Domain III focuses on the student's ability to understand groups of words in the form of paragraphs and passages. (The items in this Domain and Domain II are similar to those used in standardized reading comprehension tests and probably best exemplify the non-educator's concept of reading.)

Objectives in this domain are:

	Third Grade	Seventh Grade
Read for significant facts.	*R9*	*R29*
Read for facts and understand relationships.	*R10*	*R30*

Summary

Two items caused difficulty because they required previous knowledge to answer the question. Third grade scores ranged from 26% to 88% on 22 items. In part the low scores might be attributed to the length of the passages that third graders had to read to answer the questions. The reading committee felt that the complexity and some vocabulary were too difficult.

Seventh grade scores ranged from 22% to 96% on 26 items. Seventh grade students scored 96% and 88% in reading a Department of Agriculture advertisement concerning protection of our forests. The low score was on an item identified by the committee as "confusing". Both grade levels did better on items related to "reading for significant facts" when presented with shorter passages.

INFERENTIAL COMPREHENSION: Analytic Inference

Domain IVa focuses on the student's ability to analyze a passage to find a particular idea.

Objectives in this domain are:

	Third Grade	Seventh Grade
Draw inferences from information given.	*R11*	*R31*
Draw inferences from information given plus additional knowledge.	*R12*	*R32*
Determine the main idea when it is not directly stated.	*R13*	*R33*
Analyze passages for consistent logic.	--	*R34*

Summary

At the third grade level, this domain contained 14 items with scores that ranged from 19% to 80%. Many of the items were related to long, difficult passages with difficult form and vocabulary. The 80% score measured the student's ability to draw inferences from information given where the answer was the only fact directly stated in the short passage. The low 19% score was obtained on an item which used the outdated figure of speech, "horse sense".

At the seventh grade level, the scores ranged from 15% to 95% on 19 items. There appeared to be a reasonable number of items per objective and the items seemed to be appropriately difficult. The lowest scores deal with a relatively long, difficult passage about a foreign culture in which two answer choices were valid inferences. Those items calling for increased judgmental reasoning with more dependence upon passage intent and less upon specific statements which could be slightly restated or translated, presented the most difficulty. The items addressing the question of consistent logic were not particularly strong.

INFERENTIAL COMPREHENSION:
Evaluative Inference

Domain IVb focuses on the student's ability to evaluate a passage and make a judgment about information it contains.

Objectives in this domain are:

	Third Grade	Seventh Grade
Draw inferences from information given.	R14	R35
Draw inferences from information given plus additional knowledge.	R15	R36
Determine the main idea when it is not directly stated.	R16	R37

Summary

The reading material ranged from short sentences to long passages. Scores for third graders ranged from 18% to 81% on six items. The vocabulary was very difficult and inference level questions are above the cognitive development levels of most third graders.

Seventh graders scored from 10% to 98% on eight items. One question involved negation, a complicating factor, which seventh graders did very well on. The low scores were related to a confusing question on a very difficult passage about budgeting and spending in suburbia.

RECOGNIZING THE UTILIZATION OF LITERARY DEVICES

Domain V includes interpreting poetry, figures of speech and other fairly sophisticated devices used in prose. Ability to perceive important literary devices is central to any indepth exploration of literature.

Objectives in this domain are:

	Third Grade	Seventh Grade
Understand the author's purpose and projected viewpoint	*R17*	*R40*
Interpret figures of speech	*R18*	*R38*
Perceive the author's tone or mood	---	*R39*

Summary

Two poems used numbered lines to identify a particular phrase which the committee felt was distracting and not useful. The scores for both grade levels were low. The committee felt that the items were difficult but that all students could use more exposure to literary devices. Current reading programs should be scrutinized in the light of the poor showing in this domain.

Third grade scores ranged from 9% to 81% on 10 items. Unfamiliarity with some of the vocabulary and unusual formats account for the low scores. The high score was in regard to a humorous passage asking what the author was trying to do by having a fish get out of the water and walk around the park.

Scores for seventh graders ranged from 22% to 80% on 12 items. The low score was related to a Shakespearean sonnet which is beyond the experiential range of the students. The high score was from a short passage about a spooky night asking about the mood of the story.

COMPREHENSION OF NON-TEXTUAL AND REFERENCE MATERIALS

Domain VI focuses on the ability of students to interpret some graphic and real life sources of information.

The objectives in this domain are:

	Third Grade	Seventh Grade
Select the sentence that best interprets a picture	R19	R41
Obtain information from maps	R20	R44
Obtain information from charts and graphs	---	R43
Find information in encyclopedias, directories and indexes.	R21	R45

Summary

The items measuring picture interpretation required directions in the item and did not, in the committee's opinion, test the objective. Oral administration of the questions about the picture would have measured the objective better. Both grades did very well on five map reading questions with true/false answer choices. This is not comparable, however, to items with four or five responses.

Third graders scored from 46% to 90% on 10 items. The low scores required research skills for which third graders have probably had little need. The short questions about pictures appear to be appropriately written for third grade readability.

Scores for seventh graders ranged from 30% to 98% on 18 items. Several items were very easy for seventh graders including answering a question about a picture which was also used at the third grade level. The lowest score was obtained from an item which provided students with a theoretical table of contents from a news magazine asking them to identify the section most likely to contain a movie review. The correct answer, "cinema," was passed over by many who logically chose "tneatre". This is a case of poor construction. Another low score called for a contrary-to-fact inference to be drawn; an extremely difficult transposition for a seventh grader to perform.

Overall scores in this domain suggest that students cope with non-textual kinds of tasks more effectively than those requiring more intensive examination of narrative and, indeed, of even minimal print messages. Possibly visual-graphic literacy is a more effective route to information acquisition than printed narrative.

OVERVIEW OF THE THIRD GRADE SUMMARY TABLE

Table C is a summary of the third grade mathematics results. Each math item/objective is located on the chart by item number (m1-m54) according to theme. The table shows the percentage of students who answered each item correctly.

Theme

The data are organized by themes with each item/objective identified and grouped within them. Themes for third grade are:

addition	sets
subtraction	writing sentences
numeration	solving sentences
multiplication	geometry
fractions	measurement
number theory	probability and statistics

Priority

Priority I: Objectives dealing with concepts, skills and applications which are essential for all students and are minimum prerequisites for continued study of mathematics. Acceptable performance--75% or more of the students responded correctly to the item; Unacceptable--less than 75% of the students responded correctly.

*Priority II: Objectives dealing with concepts, skills and applications which are essential but in-depth mastery is not expected at this level. Acceptable performance--50% or more of the students responded correctly; Unacceptable--less than 50% of the students responded correctly.

Third Grade Summary Table C

Addition
m 1. 88%
m 2. 92%
m 3. 80%
m 4. 91%
m 5. 78%
m 6. 87%
m 7. 94%
m 8. 96%
m 9. 82%
*m10. 53%

Subtraction
m11. 88%
m12. 73%
m13. 68%
m14. 90%
m15. 91%
m16. 87%
m17. 58%

Counting
m18. 46%
m19. 80%
m20. 83%

Numeration
m21. 58%
m22. 67%
m23. 63%
m24. 91%
m25. 61%
m26. 80%
m27. 44%
m28. 82%
*m29. 45%
*m30. 70%
*m31. 61%
*m32. 86%
*m33. 78%

Multiplication
m34. 70%

Fractions
m35. 32%
m36. 50%

Number Theory
*m37. 31%
m38. 62%

Sets
m39. 76%

Writing Sentences
m40. 52%
m41. 52%
m42. 61%
*m43. 75%

Solving Setences
*m44. 87%
m45. 48%

Geometry
m46. 87%
m47. 50%
*m48. 28%

Measurement
m49. 88%
*m50. 50%
*m51. 87%
*m52. 76%

Probability
m53. 61%
m54. 71%

** Objective/item numbers refer to the actual test item found in the technical and interpretive reports.

THIRD GRADE MATH SUMMARY COMMENTS

Place Value

It appears that students missed many items on the test because of their inability to apply place value concepts. The idea of place value is extremely important if students are to understand our numeration system and to perform computational algorithms. Students should be given experiences with concrete manipulative objects that help them understand place value concepts and regrouping. Counters, the bundling of sticks, the abacus, etc., should be used to provide concrete experiences for young children prior to the use of place value charts.

Addition and Subtraction With Regrouping

Performance on items involving addition with regrouping is quite acceptable. However, performance on items involving subtraction with regrouping is not quite acceptable. The common error is subtracting the smaller digit from the larger, which is easier than regrouping. Place value concepts apparently are not well understood. The statements about concrete manipulative objects under place value also apply here. Perhaps students need more practice where addition and subtraction both are included in the same set of exercises.

Geometry

Geometry objectives tested in the assessment were limited to the number line. This resulted from item selection and priority designation. This in no way negates the importance of emphasis on and periodic review of geometric terms, concepts, and symbols. There continues to be a need for manipulation with models and emphasis on visual acuity in two and three dimensions.

Order Symbols

Use of the order symbols (<,>,=) must be preceded by the development of an understanding of order concepts (greater than, less than, equal to) through a variety of experiences with counting, concrete objects and pictorial models.

Mathematical Sentences

Students need more practice making up different problem situations to fit given mathematical sentences and writing mathematical sentences to fit given problem situations. It is imperative that students see mathematical sentences as representations of a wide variety of real world problem situations.

Fractions

It is obvious from the test results that students have difficulty with the concept of a fraction. It is particularly crucial in developing this concept to involve the student with a variety of concrete manipulative experiences and different pictorial models. These experiences should expose the student to fractions as a part of a whole and as a subset (part) of a set. Different instructional materials vary in their emphasis on fractions at this level.

Number Line

Use of a number line is an instructional device and does not lend itself to assessment procedure. This is evidenced by student performances on items which included a number line. Different instructional materials vary in how they illustrate operations on the number line.

Estimation

There are two applications of the skill of estimation. The first is a situation where the estimate is the answer. The second application is using the estimate as an aid in computing. If students estimated results as part of the computational process, then results on this test might have been better.

OVERVIEW OF THE SEVENTH GRADE SUMMARY TABLE

Table D is a summary of the seventh grade mathematics results. Each math item/objective is located on the chart by item number (m55-m140) according to theme. The table shows the percentage of students who answered each item correctly.

Theme

The data is organized by themes with each item/objective identified and grouped within them. Themes for seventh grade are:

- addition
- subtraction
- numeration
- multiplication
- fractions
- number theory
- sets
- writing sentences
- solving sentences
- geometry
- measurement
- probability and statistics
- integers
- ratios
- constructions
- applications

Priority

Priority I: Objectives dealing with concepts, skills, and applications which are essential for all students and/or are minimum prerequisites for continued study of mathematics. Acceptable performance level is 75% or more of the students responded correctly to the item; Unacceptable is less than 75% of the students responded correctly.

* Priority II: Objectives dealing with concepts, skills, and applications which are essential but in-depth mastery is not expected at this level. Acceptable performance level is 50% or more of the students responded correctly; Unacceptable is less than 50% of the students responded correctly.

Seventh Grade Summary Table D

Addition
m55. 80%
m56. 40%
m57. 81%
m58. 94%
m59. 74%
m60. 45%
m61. 63%
m62. 79%
*m63. 75%

Subtraction
m64. 89%
m65. 37%
m66. 62%
m67. 92%
m68. 52%
*m69. 68%

Multiplication
m70. 72%
m71. 71%
m72. 39%
m73. 42%
m74. 59%
m75. 56%
m76. 63%
m77. 65%
*m78. 19%
*m79. 42%
*m80. 41%
*m81. 37%
*m82. 86%
*m83. 52%

Division
m84. 24%
m85. 70%
m86. 39%
m87. 62%
m88. 86%
m89. 37%
m90. 59%

Numeration
m 91. 43%
m 92. 42%
m 93. 43%
m 94. 72%
m 95. 65%
m 96. 70%
m 97. 51%
m 98. 88%
m 99. 61%
*m100. 34%

Fractions
m101. 42%
m102. 37%
m103. 51%

Integers
m104. 48%
*m105. 52%

Sets
m106. 38%

Solving Sentences
m107. 52%
m108. 51%
m109. 73%
*m110. 35%

Ratios
m111. 39%
m112. 29%

Number Theory
*m113. 70%
*m114. 19%

Writing Sentences
m115. 43%
m116. 27%
m117. 46%

Geometry
m118. 53%
m119. 59%
m120. 74%
m121. 36%
m122. 74%

Measurement
m123. 77%
m124. 62%
m125. 38%
m126. 49%
m127. 70%
m128. 52%
m129. 93%
m130. 76%
m131. 34%

Constructions
m132. 63%
m133. 89%

Probability
m134. 65%

Applications
m135. 80%
m136. 19%
m137. 39%
m138. 33%
m139. 68%
m140. 55%

SEVENTH GRADE MATH SUMMARY COMMENTS

Properties of Number Systems
Instruction related to the properties of number systems should involve utility rather than vocabulary. Thus, the emphasis in each objective should be in the action verb *apply* rather than on the action verb *recognize*. This emphasis does not mean vocabulary is to be ignored.

Distributive Property
Student performance indicates confusion about the distributive property. This property is important in understanding the multiplication and division algorithms, and will be especially important in algebra.

Number Line
Use of a number line is an instructional device and does not lend itself to assessment procedure. This is evidenced by student performances on items which included a number line. Different instructional materials vary in how they illustrate operations on the number line.

Equivalence and Order
The idea of equivalence and order is important in mathematics. These ideas are represented by a variety of test items.

Because of overall poor performance on items involving equivalence and order, equivalent quantities and alternate representations of the same quantity need emphasis. A conversion process is necessary for students to be able to find:

a) different names for a number (*i.e.*, 1/2 = 0.5 = 2/4, etc. and 2 + 5 = 7 = 7/1 = 8 - 1, etc.)

b) different names for a measure (*i.e.*, 18 inches = 1/2 yard = 1 1/2 feet).

Fractions
There are two problems in understanding the concept of a fraction. Students do not have a good grasp of using the same symbol to represent different situations; *i.e.*, (1) part of a whole, (2) subset of a set, (3) indicated division, (4) ratio. Students ought to use alternative physical models for the same mathematical representation. When a new use of a fraction is introduced, students ought to review the prior uses.

The second problem is understanding the symbolism related to fractions; *i.e.*, $2/5 \neq 2.5$.

Operations With Fractions
Test items involving operations with fractions indicate clearly that too many students have neither a conceptual understanding of nor skill with these operations.

The conceptual problem in adding and subtracting is related to equivalence since fractions are converted to common denominator form.

Because of the metric system, operations with fractions may be less important in the future at this grade level.

Operations With Decimals
Performance on items on operations with decimals is generally very acceptable. However, students consistently have difficulty with proper placement of the decimal point. This indicates a lack of applying estimation skills.

Estimation
Students should be able to: (a) estimate measures and (b) estimate the answer to a computation. The unreasonableness of many student test responses indicates that these skills need special emphasis.

Exponential Notation
Students seem to recognize exponential notation with bases which are small whole numbers (*i.e.*, 2,3,4) but have difficulty applying the concept with a base of 10 or with bases expressed as a fractional form. Instruction using exponents should include many different numbers as bases with special emphasis on 10's.

Geometry
There should be more emphasis in the elementary grades on geometric terms, concepts and symbols. This assessment seems to indicate a lack of development in this area. Proper use of vocabulary in geometry is important. There is a need for manipulation with models and emphasis on visual acuity in two and three dimensions.

Writing Mathematical Sentences
Test results indicate that students have difficulty translating verbal statements into mathematical sentences. When teaching this skill, it may be better to provide students with mathematical sentences and ask them to create the verbal statements before expecting them to interpret statements written by others.

Problem Solving
The problem solving items on the assessment dealt primarily with geometric ideas. Low performance levels may be explained by an absence of understanding of geometric ideas, as well as other factors. Problem solving is one of the most important goals of a mathematics program. Refer to the problem solving chapter in the K-8 guidelines.

MATH INTERPRETIVE CONCLUSIONS

The mathematics assessment interpretive committee, recognizing that this assessment is the initial effort to gain a statewide profile of mathematical achievement, makes the following observations:

1. The topic of per cent and its applications was not included for testing. The committee feels that this topic should be emphasized in the pre-algebra mathematics program. There was only one test item dealing with metric measure. Both per cent and metric measure should be included in future assessments.

2. Assessment results show that students made some common mathematical errors. In multidigit subtraction problems, some indicated a tendency to subtract the lesser from the greater digit rather than regrouping. Students also ignored the use of estimation in computational processes. Identifying such common errors should lead to improved teaching practices.

3. Student performance on test items requiring understanding place value suggests that students are not exposed to a variety of place value experiences, notably with manipulative materials. Student performance with fractions indicate another lack of meaningful concept development.

4. The assessment results indicate a lack of knowledge of geometric concepts, measurement concepts, and ability to write mathematical sentences to fit "problem" situations. The mathematics curriculum includes more than computation.

5. More than 50% of the seventh grade items dealing with skills and concepts obtained results identified as unacceptable. This indicates that seventh graders apparently have not mastered the mathematics expected at this level. Students' mastery of a certain skill or concept should not be considered an absolute at any given time but must be maintained through periodic review.

6. The use of several test items per objective (rather than one item per objective) would have made diagnostic interpretations more comprehensive.

7. Constraints under which the assessment was conducted made it impossible to test for evidence of stated characteristics of an exemplary mathematics program. The constraints dictated that objectives assessed could not be those which involve the facility to apply mathematical principals, skills and methods to most real life problem situations.

FINAL COMMENTS

The 1973 Pilot Statewide Assessment Program was successful in bringing the Wisconsin educational community together to develop and implement a large scale statewide assessment effort. School professionals, university personnel and Department of Public Instruction staff gave their support through devoting many hours of work to the developmental effect. Wisconsin school administrators, teachers and students cooperated fully in the actual pilot testing. In total, over 700 professional educators and 10,000 students contributed to making the pilot phase of the assessment a success.

As a result of a review of the pilot phase the following major recommendations are suggested:

MAJOR RECOMMENDATIONS

1. The instrument development process must be improved through increased involvement of educators and non-educators. The department should explore methods of paying local districts on a shared cost basis for local personnel participation.

2. The assessment program should be expanded to include grade 12 so as to provide the citizens of Wisconsin with a more comprehensive profile of the total K-12 system. A grade 12 assessment would also provide a profile of student knowledge, skills and attitudes at the latter stages of their formal, public elementary and secondary schooling.

3. Although the state assessment is primarily intended to provide statewide information, a method of local school reporting should be developed and made available to local districts on a volunteer basis. This local Education Agency Piggy-back Program (LEAPP) would allow local school districts to obtain district profiles of how their students performed on the state assessment objectives and some additional objectives which the local district may choose. In addition, district-state comparisons would be possible. At the present time district information is not available but is desired by many local districts.

4. The assessment program should move towards operationalizing the Goals for Wisconsin Education and measuring the degree to which the goals are being achieved while continuing to measure the adequacy of present educational programs.

The pilot phase of the Wisconsin Assessment Program is the first step in developing a systematic method of looking at the capabilities of Wisconsin students. Through such an information base those who influence and make educational decisions will be able to better analyze educational program strengths and weaknesses. Subsequently, program decisions can be made and their effects evaluated over time. Such a system is not a panacea for the educational problems which exist, but rather provides a continuous means of evaluating the educational needs of children of Wisconsin and the effectiveness of educational decisions in meeting those needs over time.

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4000-AA49602-74